

## (54) ANTIREFLECTION FILM

(11) 3-138602 (A) (43) 13.6.1991 (19) JP

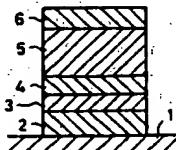
(21) Appl. No. 64-278174 (22) 25.10.1989

(71) OLYMPUS OPTICAL CO LTD (72) TOSHIAKI OIMIZU(1)

(51) Int. Cl. G02B1/10

**PURPOSE:** To obtain a good adhesion to a plastic substrate and durability by forming respective layers under a high pressure of a specific pressure and forming odd numbered layers of  $MgF_2$ .

**CONSTITUTION:** The respective layers are formed under the high vacuum of  $\leq 1 \times 10^{-16}$  Torr pressure and the 1st layer 2, 3rd layer 4, and 5th layer 6 which are the odd numbered layers are formed of the  $MgF_2$ . The residual moisture and the quantity of impurities on the surface of the plastic substrate are decreased in such a manner and the adhesion of the films and the substrate is improved. The  $MgF_2$  films deposited by evaporation under the high vacuum progress in crystallization and have the higher hardness of the films, thus having the scratching resistance equiv. to the scratching resistance of hard coated films. When the vacuum evaporation is carried out under the higher vacuum, the degree of the crystallization of the films is increased even in the cold vapor deposition of an oxide material having the high refractive index other than the  $MgF_2$ , by which the adhesion to the  $MgF_2$  is improved. Problems do not arise also in the durability, etc., even if the multilayered film constitution is adopted.



## (54) COMBINED PRISM AND FORMING METHOD THEREOF

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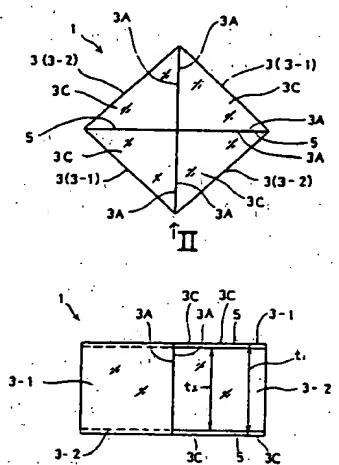
(21) Appl. No. 64-277686 (22) 24.10.1989

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**PURPOSE:** To easily produce a combined prism with high accuracy by varying the thicknesses of at least two among three or more prisms and sticking the prisms with each other by allowing the directions of thickness thereof to be in parallel.

**CONSTITUTION:** A step part 5 is formed when the two triangular prisms 3-1, 3-2 varying in the thickness are stuck with each other. The step part 5 is, therefore, usable as a reference at the time of joining these two combined prisms to form a square prism 1. The step part 5 directly utilizes the side face 3A of the triangular prisms 3 and has the sufficient accuracy as the reference at the time of sticking. Thus, the square prism 1 is formed easily with the high accuracy by using jigs of various structures to be the step part 5 as the reference.



## (54) HOLOGRAPHIC EXPOSING DEVICE

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**PURPOSE:** To easily obtain a grating having a large grating pitch by making collimated luminous fluxes incident on a transparent both-face reflecting plate having such a front surface and rear surface which are the planes intersecting with each other at a certain angle and making two luminous fluxes which are reflected to the same side from both front surface and rear surface incident on the substrate.

**CONSTITUTION:** The luminous fluxes F1, F2 reflected to the same side from both the front and rear surfaces of the double-face reflecting plate C having both the front and rear surfaces which are the planes intersecting with each other at the angle  $\delta$  intersect with each other at approximately  $2\delta \approx 2\delta$  angle when the collimated luminous fluxes F are made incident on the reflecting plate C from an arbitrary direction. Interference fringes are formed on a substrate 3 when these two luminous fluxes F1, F2 are projected into the substrate 3. The spacing (d) between the formed interference fringes is  $d = \lambda / \sin \delta$  when the two luminous fluxes F1, F2 are made incident at  $\delta$  incident angle respectively on the substrate. Since the  $\delta$  is set small, the diameter of the substrate is approximately equal to F1, F2 and since  $\delta$  is selectable from the finite size up to 0, the arbitrary formation of the interference fringe of the large spacing is possible. Thus, the grating having the large grating spacing is obtd.

